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Finally it may be said that the general scheme and mode of treatment of the book follow the lead of the comprehensive treatise of Chamberlin and Salisbury, and the fundamental views which give distinctive character to that work find reflection in this.

R. T. C.

Geology of the Kiruna District (2). Igneous Rocks and Iron Ore of Kürunavaara Luossovaara and Tualluvaara. Academical Dissertation by PER A. GEIJER, for the degree of Doctor of Philosophy. By the permission of the philosophical faculty of the University of Upsala. Stockholm, 1910. Pp. 278; 2 geologic maps.

The district is in northern Lapland. The rocks, which are generally regarded as pre-Cambrian, include greenstones, conglomerates, syenite porphyries, magnetite ores, quartz porphyry, phyllites, sandstones, etc. They are strongly folded and in general stand nearly vertical but otherwise do not show pronounced metamorphism. The textures are well preserved. A typical ore body is the one of Kürunavaara which forms the backbone of a mountain about 748 meters high. This ore body is over 5 kilometers long and some 96 meters wide. Other ore bodies are somewhat smaller. The ore zone is included between quartz porphyry and syenite porphyry. The minerals of the ore are magnetite, hematite (subordinate), fluor-apatite, augite, amphibole, biotite, titanite, tourmaline, zircon, etc. Generally there is enough apatite to place the ore above the Bessemer limit.

The ore minerals are intergrown like those of an igneous rock and contacts between ore and country rock are in places gradational. All of the minerals of the ore except tourmaline are primary constituents of igneous rocks near by. Rock textures indicate that the ore mass has crystallized quite in the same way as an igneous rock—these include trachytoidal flow structure, skeleton forms of magnetite, and the ophitic distribution of augite. The ores are believed to be of magmatic origin and the writer is inclined to the view that the associated syenites are effusive in character. He does not agree with De Launey, who held that the ores were deposited at the surface from gases and hot solutions by pneumatolytic-sedimentary processes. The writer does not feel sure as to the nature of the differentiation processes which have resulted in the product, but does believe that such an origin is proven.

W. H. E.